INSTRUō | SPECIALIST SYNTHESIZERS
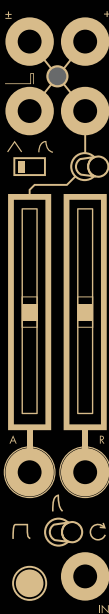
cnōc

Function Generator

User Manual

Contents

Description

The Instruō **cnōc** is a fully analogue voltage-controlled two stage function generator. This style of function generator was pioneered by the West-coast mindset of sound synthesis and goes far beyond the functionality of a traditional envelope generator. With AR, ASR, and Looping modes, as well as its unipolar positive and bipolar outputs, **cnōc** finds its home in any patch.

Whether you need a general envelope generator, LFO, delayed gate signal, or a slew limiter to add portamento to your pitch sequences, **cnōc** fits the bill.

Features

- AR, ASR, and Looping envelope modes
- External control over Attack and Release stages
- Unipolar positive and bipolar outputs
- Assignable gate output
- Manual trigger button
- Slew limiting functionality
- Two response curve settings

Installation

- Confirm that the Eurorack synthesizer system is powered off.
- Locate 4 HP of space in your Eurorack synthesizer case.
- Connect the 10 pin side of the IDC power cable to the 2x5 pin header on the back of the module, confirming that the red stripe on the power cable is connected to -12V.
- Connect the 16 pin side of the IDC power cable to the 2x8 pin header on your Eurorack power supply, confirming that the red stripe on the power cable is connected to -12V.
- Mount the Instruō **cnōc** in your Eurorack synthesizer case.
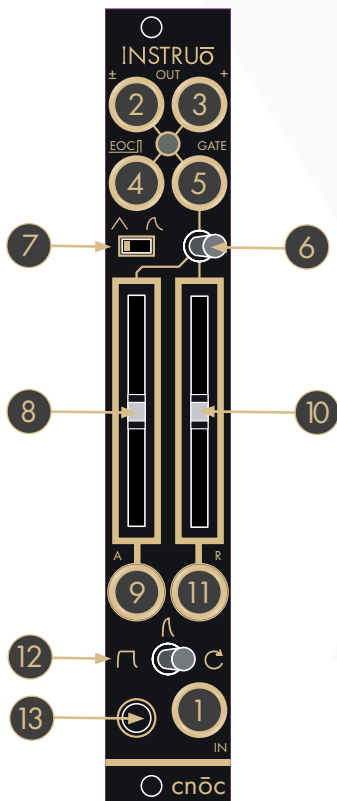- Power your Eurorack synthesizer system on.

Note:
This module has reverse polarity protection.
Inverted installation of the power cable will not damage the module.

Specifications

- Width: 4 HP
- Depth: 27mm
- +12V: 45mA
- -12V: 40mA

cnōc | knɤʊk | noun (landscape) a natural elevation or raised landscape; an accumulated heap or mound

Key

1. Signal Input
2. Bipolar Output
3. Unipolar Positive Output
4. EOC Output
5. Gate Output
6. Stage Gate Toggle
7. Response Curve Switch
8. Attack Fader
9. Attack CV Input
10. Release Fader
11. Release CV Input
12. Mode Toggle
13. Trigger/Charge Direction Button

Signal I/O ━━

Signal: The **Signal** input is a bipolar input used for function generation.

- A trigger or gate signal present at the **Signal** input will ping an envelope at the **Bipolar** and **Unipolar Positive** outputs.
- If the **Mode** toggle is set to **ASR Mode**, a control voltage signal present at the **Signal** input will be slewed at the **Bipolar** and **Unipolar Positive** outputs based on the settings of the **Attack** and **Release** faders (See the **Mode**, **Attack**, and **Release** sections for more information).

Bipolar: The **Bipolar** output is a bipolar control voltage output.

- Output range: 10Vpp.

Unipolar Positive: The **Unipolar Positive** output is a unipolar positive control voltage output.

- Output range: 0V - 10V.

EOC: The **EOC** output will output a 1ms trigger signal at the end of each cycle.

- Output voltage: 10V.

Gate: The **Gate** output will output a gate signal for the duration of either the **Attack** stage or the **Release** stage, based on the position of the **Gate Mode** toggle.

- Output voltage: 10V.

Stage Gate: The **Stage Gate** toggle determines whether the gate signal present at the **Gate** output is in relation to the **Attack** stage or the **Release** stage.

Function Generator ▬

Response Curve: The **Response Curve** switch controls the contour of the function.

- Setting the switch to its left position will set the function to a linear response curve.
- Setting the switch to its right position will set the function to a logarithmic/exponential response curve.
  - This setting will have a logarithmic **Attack** stage and an exponential **Release** stage.

Attack: The **Attack** fader defines the onset duration of the function. The value set by this control is measured in the time domain.

- Moving the fader upward will increase the attack time.
- Moving the fader downward will decrease the attack time.
- The fader's LED will illuminate with ascending voltage.

Attack CV: The **Attack CV** input is a bipolar control voltage input for the **Attack** parameter.

- Control voltage is summed with the fader position.

Release: Once the **Attack** stage has completed, the **Release** fader defines the time it takes for the function to to return to its starting voltage.

- Moving the fader upward will increase the release time.
- Moving the fader downward will decrease the release time.
- The fader's LED will illuminate with descending voltage.

Release CV: The **Release CV** input is a bipolar control voltage input for the **Release** parameter.

- Control voltage is summed with the fader position.

**Mode:** The **Mode** toggle sets the function mode.

- If the toggle is in the left position, the function is set to **ASR** (Attack/ Sustain/Release) **Mode.**
- If the toggle is in the centre position, the function is set to **AR** (Attack/ Release) **Mode**.
- If the toggle is in the right position, the function is set to **Looping Mode**.
    - Cycle times in **Looping Mode** range between ~1ms (oscillation of ~1 kHz) and ~20s (oscillation of ~0.05 Hz).

Trigger/Charge Direction: Pressing the **Trigger/Charge Direction** button will manually trigger the function. It will also control a manual soft synchronization of the function's charge direction.

Patch Examples

West Coast Synth Voice:

Summary: A sequencer sends voltage to the oscillator while simultaneously triggering **cnōc**. The **Unipolar Positive** output of **cnōc** opens the wavefolder, allowing the oscillator signal to pass through.
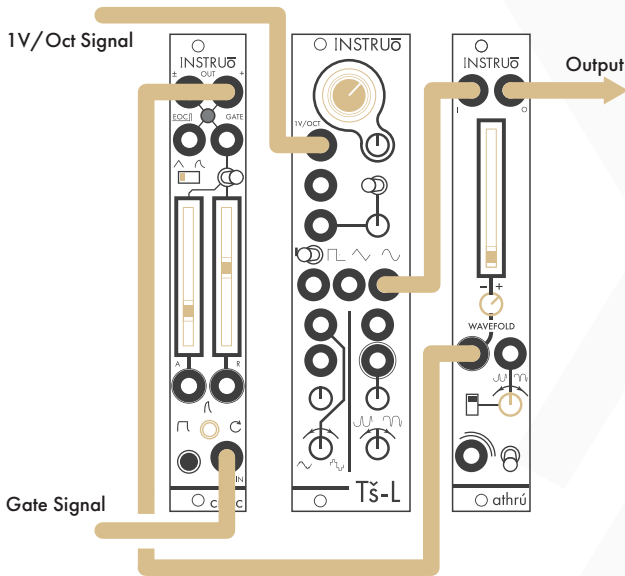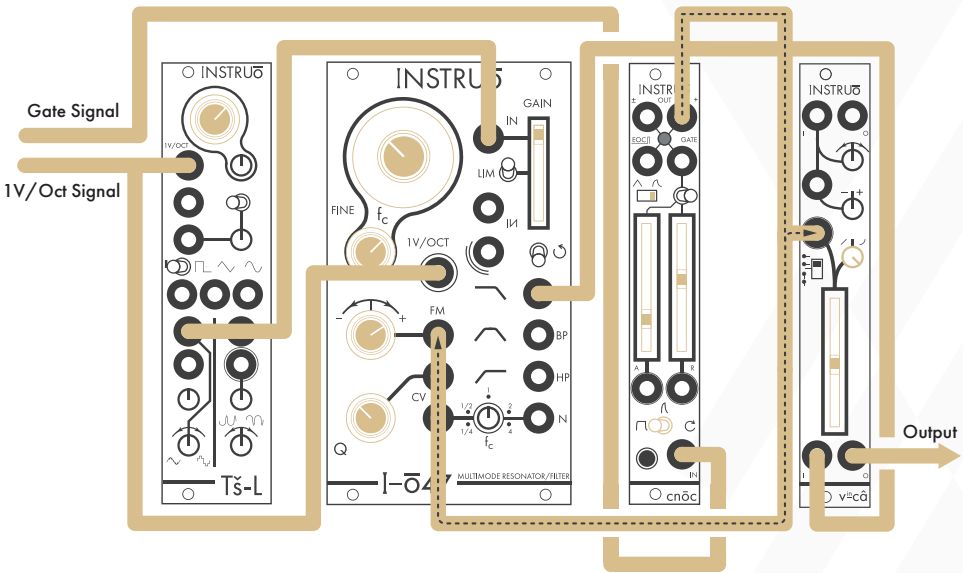

Audio Path:

- Connect the sine waveform of an oscillator to the audio input of a wavefolder.
- Monitor the audio output of the wavefolder.
- Set the wavefold amount of the wavefolder to its minimum position.
- Set the symmetry bias of the wavefolder to a desired position.

Control Path:

- Connect the 1V/Oct output of a sequencer to the 1V/Oct input of the oscillator.
- Connect the gate output of the sequencer to the **Signal** input.
- Set the **Mode** toggle to **AR Mode**.
- Set the **Response Curve** switch to a desired position.
- Connect the **Unipolar Positive** output to the CV input of the wavefolder and set the corresponding CV attenuator to a desired position.
- Set the **Attack** and **Release** faders to desired positions.

East Coast Synth Voice:

Summary: A keyboard sends voltage to the oscillator while simultaneously triggering **cnōc**. The **Unipolar Positive** output of **cnōc** opens the filter and VCA, allowing the oscillator signal to pass through. More traditional East Coast patches would incorporate separate **cnōc** modules for the filter and VCA.
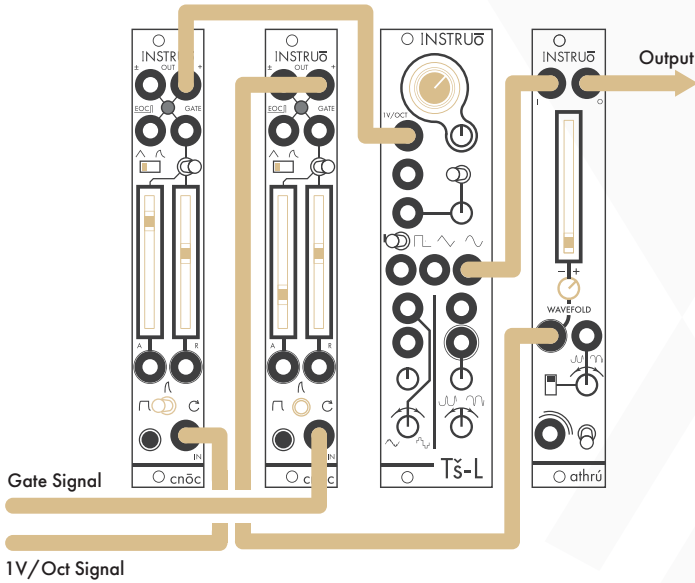

Audio Path:

- Connect the desired waveform of an oscillator to the audio input of a filter.
- Connect the audio output of the filter to the audio input of a VCA.
- Monitor the audio output of the VCA.
- Set the fundamental frequency of the oscillator to a desired position.
- Set the cutoff frequency of the filter to a desired position.
- Set the resonance of the filter to a desired position.
- Set the level of the VCA to its minimum position.

Control Path:

- Connect the 1V/Oct output of a keyboard to the 1V/Oct input of the oscillator.
- Connect the gate output of the keyboard to the **Signal** input.
- Set the **Mode** toggle to **ASR Mode**.
- Set the **Response Curve** switch to its right position.
- Connect the **Unipolar Positive** output to a multiple.
- Connect one copy of the **cnōc** CV signal to the cutoff frequency CV input of the filter and set the corresponding CV attenuator to a desired position.
- Connect a second copy of the **cnōc** CV signal to the CV input of the VCA and set the corresponding CV attenuator to a desired position.
- Set the **Attack** and **Release** faders to desired positions.

CV Slew Limiter:

Summary: Adapting the **West Coast Synth Voice** – A sequencer's voltage is slewed through **cnōc**, creating a portamento (glide) effect between successive notes.

Audio Path:

- Connect the sine waveform of an oscillator to the audio input of a wavefolder.

Control Path:

- Instead of connecting the 1V/Octave output of the sequencer directly to the 1V/Octave input of the oscillator, connect it to the **Signal** input of a secondary **cnōc**.

- Set the **Mode** toggle to its left position to select **ASR Mode**.
- Set the **Response Curve** switch to a desired position. Setting the switch to its left position to select a linear response curve will yield more obvious results.
- Connect the **Unipolar Positive** output to the 1V/Octave input of the oscillator.
- Set the **Attack** and **Release** faders to desired positions. The **Attack** fader will set the amount of portamento between ascending notes, while the **Release** fader will set the amount of portamento between descending notes.

Quadrature Modulation:

Summary: This patch uses two **cnōc** modules. The first **cnōc** is set to generate a one-shot triangle waveform function. A gate signal generated during the release stage triggers a second **cnōc** that is also set to generate a one-shot triangle waveform. A gate signal generated during the release stage of the second **cnōc** retriggers the first cnōc. This method of circular patching creates two triangle waveforms that are 90 degrees out of phase from one another. Both **cnōc** modules also continuously retrigger each other. One triangle waveform controls the amount of wavefolding while the other triangle waveform the amount of filtering, creating a quadrature, dual timbral modulation.
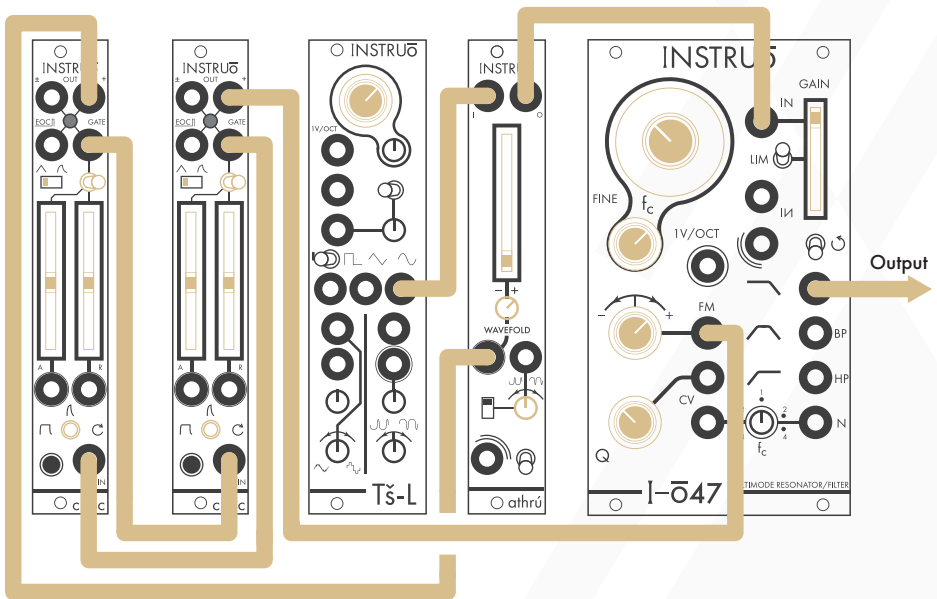
Audio Path:

- Connect the sine waveform of an oscillator to the audio input of a wavefolder.
- Connect the audio output of the wavefolder to the audio input of a filter.
- Monitor the audio output of the filter.
- Set the fundamental frequency of the oscillator to a desired position.
- Set the wavefold amount of the wavefolder to a desired position.
- Set the symmetry bias of the wavefolder to a desired position.
- Set the cutoff frequency of the filter to a desired position.
- Set the resonance of the filter to a desired position.

Control Path:

- Set the **Response Curve** switch of both **cnōc's** to their left positions to select linear response curves.
- Set the **Mode** toggles of both **cnōcs** to their left positions to select **AR Mode**.
- Set the **Attack** and **Release** faders of both **cnōc** to equal positions to create triangle waveform functions.
- Set the **Stage Gate** toggles of both **cnōc's** to their right positions to create gate signals at the **Gate** outputs during their release stages.
- Connect the **Gate** output of the first **cnōc** to the **Signal** input of the second **cnōc**.
- Connect the **Gate** output of the second **cnōc** to the **Signal** input of the first **cnōc**.
- Connect the **Unipolar Positive** output of the first **cnōc** to the CV input of the wavefolder to control the amount of wavefolding and set the corresponding CV attenuator to a desired position.
- Connect the **Unipolar Positive** output of the second **cnōc** to the FM input of the filter and set the corresponding FM attenuator to its desired position.

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